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## U. S. WAR FOOD ADMINISTRATION

## A SWEETPOTATO STORAGE

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U. S. Department of Agriculture

## Contents

	Page
Sweetpotato Storage Applications - - - - -	2
Converting Buildings - - - - -	2
*On-Farm" Applications - - - - -	3
When Required - - - - -	3
Forms to be used - - - - -	3
Where to File Applications - - - - -	3
"Off-Farm" Applications - - - - -	3
When Required - - - - -	3
Forms to be Used - - - - -	3
Where to File Applications - - - - -	4
Approved Designs and Construction Materials - - - - -	4
Insulation - - - - -	4
Foundation and Floors - - - - -	4
Walls and Roofs - - - - -	4
Partitions - - - - -	5
Electrical - - - - -	5
Heating - - - - -	5
Plans and Bills of Materials	
Detail sheet 2, plans 3215-16-17 - - - - -	6
500 bushel capacity, plan 3217	
Working drawings, sheet 1 - - - - -	7
Bill of materials - - - - -	8
4000 bushel capacity, plan 3215	
Working drawings, sheet 1 - - - - -	9
Bill of materials - - - - -	10
20,000 bushel capacity, plan 3216	
Working drawings, sheet 1 - - - - -	11
Bill of materials - - - - -	12

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The plans suggested for sweetpotato storages were developed in cooperation with the Agricultural Engineering Division, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, with the assistance of Extension Agricultural Engineers from Georgia, Louisiana and Maryland for the purpose of providing efficient storage designs in popular capacities using minimum amounts of critical materials.

Further suggestions on the design, construction and operation of sweetpotato storages are given in a mimeograph - "Additional Storage Facilities Needed for Increased Sweetpotato Crop" - recently issued by the War Food Administration. Copies of this report have been distributed to State and County USDA War Boards and the Extension Services.

## SWEETPOTATO STORAGE APPLICATIONS

Since sweetpotato storage facilities must be expanded within a relatively short period of time to provide for the 1943 crop, particular attention should be given to the preparation and submittal of applications for construction approval as required under Conservation Order L-41. Applications which are carefully prepared and well supported clear with minimum delay. Poorly or improperly prepared applications are time losers because they cannot be processed expeditiously. It is also important that applications be filed on the correct forms and through the proper offices so that all necessary concurrences are attached to each case file before it is submitted to the War Production Board. Application forms and assistance in their preparation can be secured from USDA War Boards or War Production Board Field Offices.

It is particularly important that all applicable questions on application forms be fully answered and that the required number of copies be submitted. All materials, including heating equipment, required for the project must be listed whether they are on hand, used, or to be purchased. Used material, material on hand, or locally sawed lumber should be so identified. When applications are properly prepared, the War Production Board analyst has no difficulty in determining (1) what is to be constructed, (2) whether the project is necessary in view of wartime construction restrictions, and (3) the total amount, value, and kinds of material to be used in the construction. It must be remembered that final War Production Board approval or disapproval of an application is based on the information given in the case file. To secure approval, applications must be properly prepared; the essentiality of the project must be shown; and it must be demonstrated that the minimum amount of critical materials are to be used.

Converting Buildings. A large number of existing buildings will be converted for sweetpotato storage. Conversion applications must contain supplementary information so that the War Production Board analyst can readily check the quantity and kinds of material requested. No two buildings to be converted into storages will be alike and, therefore, each must be considered as a special problem. In general, less material per bushel capacity will be required for conversion than for new buildings.

Applications for converting buildings into sweetpotato storages should include the following additional information:

1. Size of building and anticipated capacity (state whether container or bulk storage)
2. Construction and condition of building. Give size, length, and spacing and kind of material of joists, girders and posts.
3. Material estimated for conversion. Show separately quantities for strengthening floors, lining interior of building, constructing bins (where bulk storage is to be used), etc.

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4. Condition of heating system, if any, and repairs needed.  
If no heating system available, specify new system needed.

#### "On-Farm" Applications

When Required War Production Board approval to begin construction is required when the total cost of all new agricultural construction (excluding dwellings) on any one farm amounts to \$1000 or more in any continuous 12-month period, beginning September 7, 1942. Construction approval is also required when a new utility connection, not previously authorized, is necessary, regardless of the total cost of construction.

Forms to be Used Where the total cost of an "on-farm" project is less than \$10,000, the application must be submitted on Form WPB-2570. Where the total cost is \$10,000 or more, the application must be submitted on Form WPB-617. Where a new utility connection is required, the construction application must be accompanied by a statement from the utility company that the connection can be made under Order U-1-c, or by the utility company's application on Form WPB-277<sup>4</sup> for authority to make the connection, whichever is applicable.

Where to File Applications Every "on-farm" construction application must be filed with the County USDA War Board for the county in which the project will be built. County War Boards review applications for correctness, attach recommendations on Form W.B. L-41, and forward the case files to State USDA War Boards. After State recommendations are attached, cases costing less than \$10,000 are forwarded to the appropriate War Production Board Regional Office and cases costing \$10,000 or more are forwarded to the War Production Board, Washington, D. C., for final processing.

#### "Off-Farm" Applications

When Required Under Conservation Order L-41, "off-farm" sweetpotato storage would be classified as "other restricted construction", and War Production Board construction approval is required when the total cost of the project is \$1000 or more during any continuous 12-month period, beginning September 7, 1942. Construction approval is also required when a new utility connection, not previously authorized, is necessary, regardless of the total cost of the construction.

Forms to be Used Applications for construction approval for "off-farm" facilities must be submitted on Form WPB-617 except where the project requested merely includes an addition to an existing sweetpotato storage building and the capacity is not increased by more than 20 percent. Applications for projects which fall within the latter category may be filed on Form WPB-2570, provided they are transmitted to the War Production Board Regional Office for final processing. Where a new utility connection is required, the construction application must be accompanied by the utility company's application (Form WPB-277<sup>4</sup>) for authority to make the utility connection. Both applications are processed simultaneously.

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Where to File Applications. Applications for the construction of "off-farm" storage facilities may be filed directly with the War Production Board, Washington, D. C., unless the project merely involves an addition to an existing sweetpotato storage and does not increase its capacity by more than 20 percent. The latter cases may be forwarded to the appropriate War Production Board Regional Offices for final processing. While it is not necessary that "off-farm" construction applications be filed through USDA War Board channels, applications supported by War Board recommendations may receive more favorable consideration.

#### Approved Designs and Construction Materials

Plans and bills of materials for sweetpotato storage houses with capacities of 500, 4,000 and 20,000 bushels in crates are attached. The 4,000 and 20,000 bushel plans have been approved by the Construction Bureau of the War Production Board with the understanding that the proposed frame construction will be used only in areas where locally sawed lumber is available. In other areas, masonry or other materials must be used in the walls to reduce the amount of lumber required. For frame construction, not more than  $2\frac{1}{2}$  board feet of lumber per bushel capacity will be permitted. Where masonry walls are used, not more than 1.9 board feet of lumber per bushel capacity should be used. Applications for the construction of sweetpotato storages requiring War Production Board approval will be processed without delay if the building designs and material requirements conform generally to the approved plans and material lists.

Insulation. The amount of insulation needed in sweetpotato storages depends upon outside temperatures, and in order to simplify recommendations the main sweetpotato producing area has been divided into three temperature zones as shown on sheet 2, plan 3215-16-17 attached. Wall constructions for the three zones are suggested on this sheet, and roof and ceiling construction should have equivalent insulation.

Foundation and Floors. The plans show suggested depth of foundations for Zone A. Additional quantities have been included in the material lists to increase the depth of outside and partition walls 8 inches in Zone B and 16 inches in Zone C. Additional quantities of concrete for footings have also been allowed for masonry wall construction. Continuous masonry walls uniformly spaced between foundation walls, as shown on the plans, eliminate wood girders, thus conserving lumber.

Walls and Roofs. In Zone A lumber quantities include ceiling for lining the interior of walls and roofs. Where available, other materials with similar insulation values can be substituted. Wood lining  $\frac{3}{4}$ " thick provides sufficient insulation in Zone A and is generally available locally. In other zones, a single thickness of lumber on the interior is not adequate, and therefore insulation must be used in order to keep the lumber requirements within the permitted  $2\frac{1}{2}$  board feet per bushel capacity.



Materials for masonry walls have been figured in square feet, which can readily be converted by any building material dealer into the number of units of cinder or concrete block, tile, or brick required.

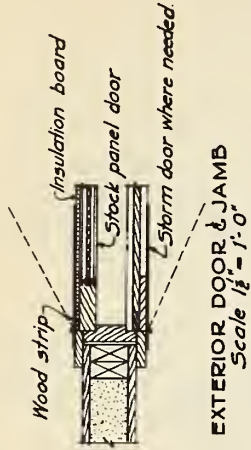
Additional quantities of shiny-surfaced, vaporproof felt or vaporproof kraft paper will be needed where the interior lining is not vaporproof. This should be installed on the studs or rafters before placing the interior lining. Ordinary asphalt-saturated felt, which is not vaporproof, should be used under the wood siding. If vaporproofed insulation is not obtainable in Zones B and C, ordinary insulation should be protected by vaporproof felt or be given a vaporproofing treatment.

Partitions. Masonry partitions were figured for the masonry wall construction. However, no furring or interior lining was included for these partitions, in order to economize on materials. In colder areas it might be desirable to insulate one side of such partitions.

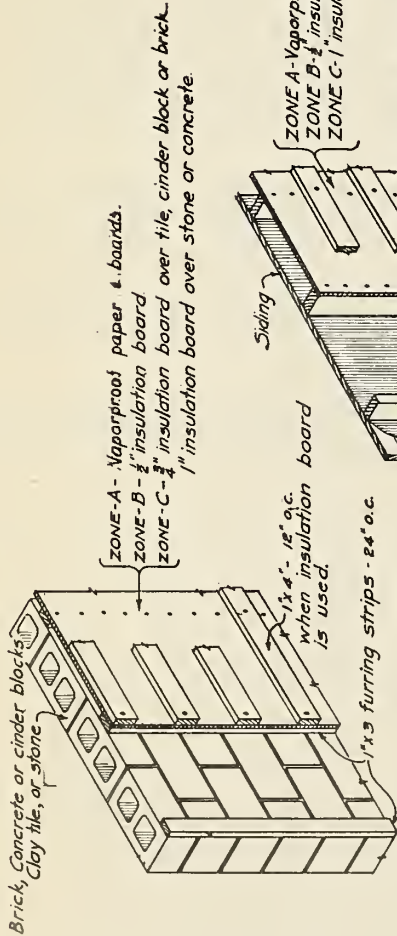
Electrical. Quantities of wiring, fittings and fixtures permitted by the War Production Board are listed in the material bills. None are included for the 500 bushel storage, as it was considered that there would be little need for artificial lighting in structures of this size. In building two units of any plan, the quantities for the single unit may be doubled, except that only one service entrance of higher capacity will be permitted.

Heating. Light weight, sheet-metal, wood-burning stoves are suggested for heating sweetpotato storages, as this type of heating unit requires a minimum amount of metal. Where sufficient metal is obtainable, flues similar to those used in tobacco barns might be installed under the slatted floor. In the larger commercial storages it may be necessary to utilize steam or hot water heating.

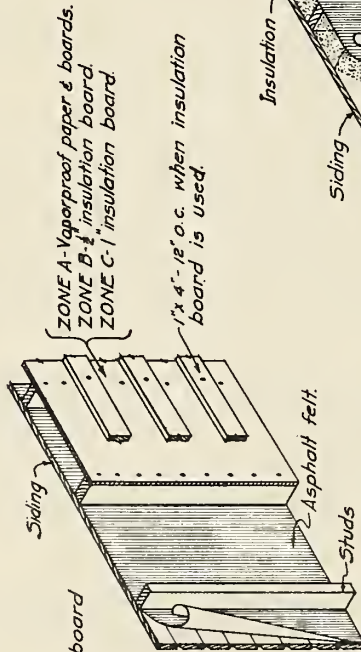
The type, size, and weight of all heating equipment to be purchased must be listed on applications for construction requiring War Production Board approval.



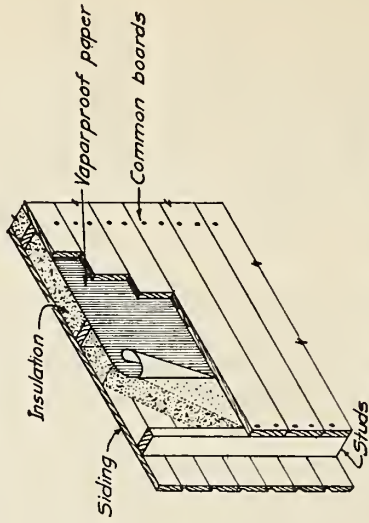
EXTERIOR DOOR & JAMB  
Scale  $1\frac{1}{2}'' = 1'-0''$



MASONRY WALL (WITH FURRING)

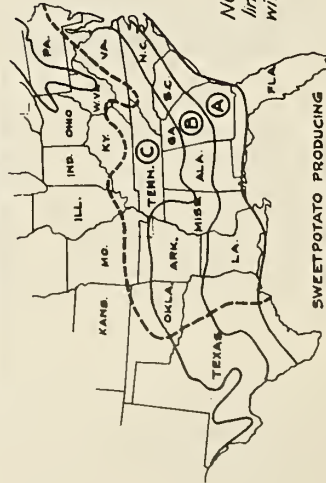


FRAME WALL



FRAME WALL (FILL INSULATION)  
Zones B and C

ZONE MAP FOR  
SWEETPOTATO PRODUCING AREA

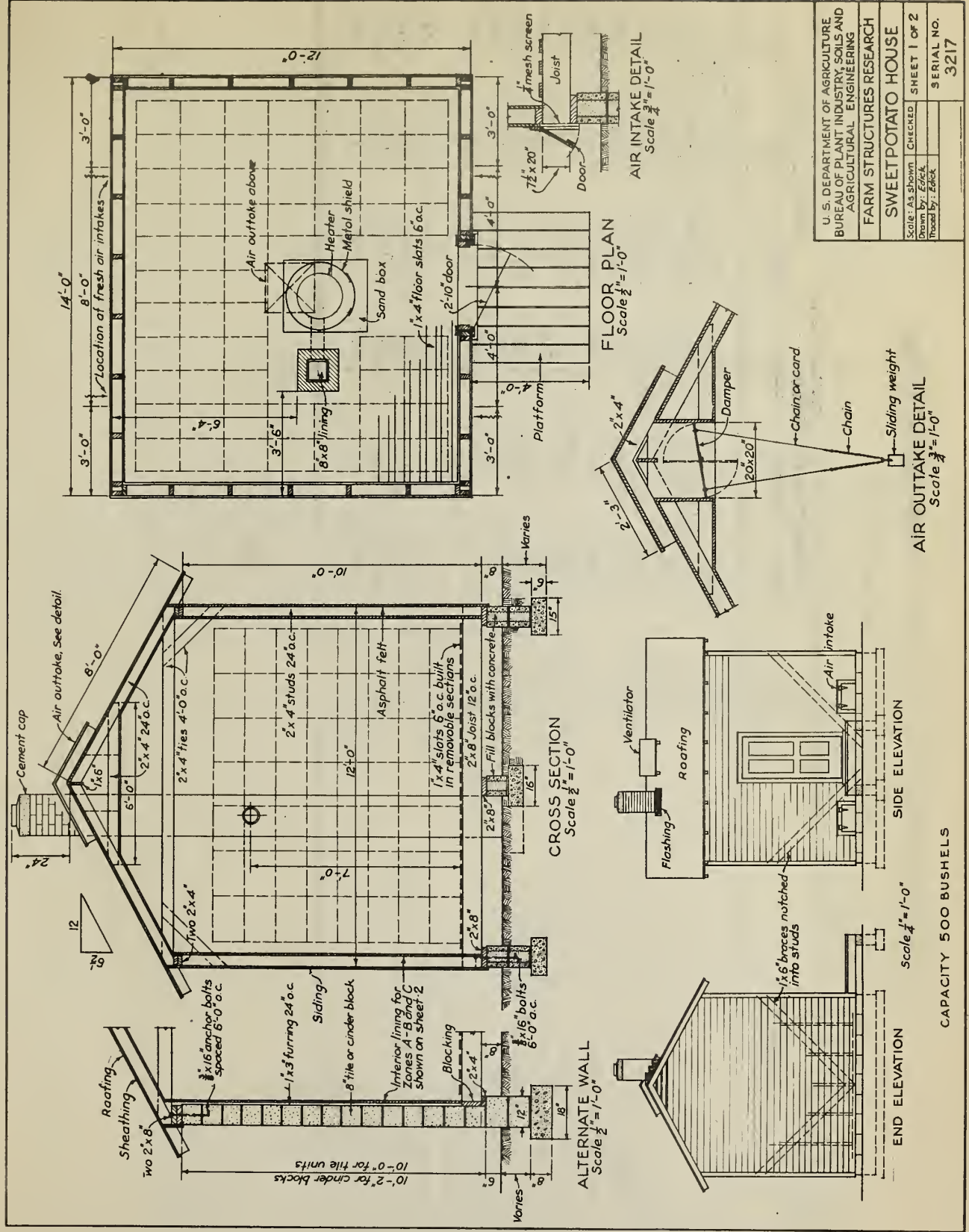


SWEETPOTATO PRODUCING  
AREA EAST AND SOUTH  
OF HEAVY BROKEN LINE

NOTE: Fiber boards used for interior lining should be vaporproofed or covered with vaporproof paper.

U. S. DEPARTMENT OF AGRICULTURE BUREAU OF PLANT INDUSTRY, SOILS AND AGRICULTURAL ENGINEERING			
FARM STRUCTURES RESEARCH			
SWEETPOTATO HOUSE			
Scale: As shown	CHECKED	SHEET 2 OF 2	
Drawn by Edick		SERIAL NO.	
Traced by Swannick		3215-16-17	



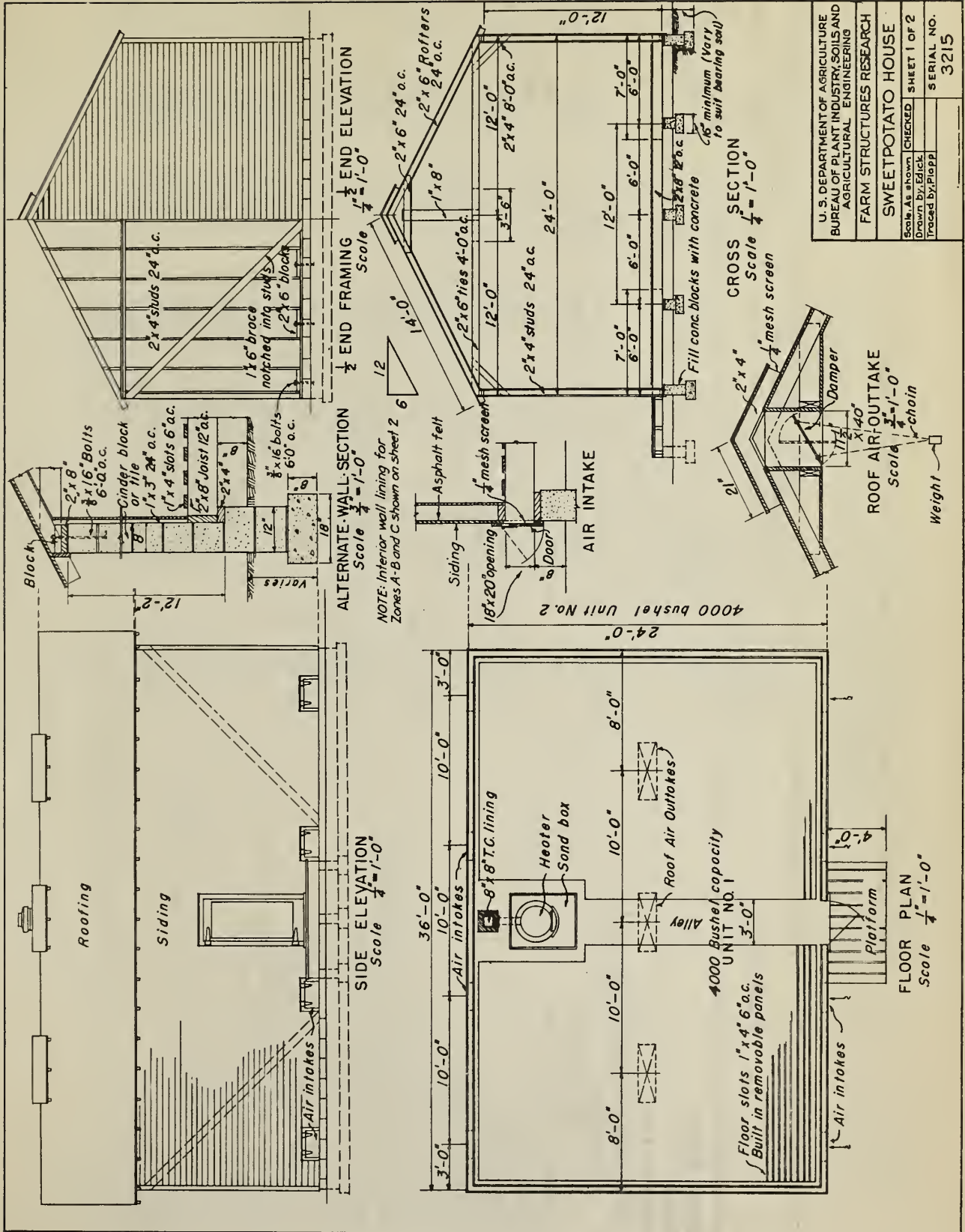


CAPACITY 500 BUSHELS

# Estimated Material to Build 500 Bu. Sweetpotato Storage

Size 12' x 14' Plan No. 3217

Material	Unit of Measure	Frame Construction			Masonry Walls		
		Zone A	Zone B	Zone C	Zone A	Zone B	Zone C
Sheet steel	Lbs.	20.00	20.00	20.00	20.00	20.00	20.00
Nails	"	75.00	75.00	75.00	75.00	75.00	75.00
Brick	M	.50	.50	.50	.50	.50	.50
Flue tile	Lin. ft.	10.00	10.00	10.00	10.00	10.00	10.00
Roll roofing	Sq.	3.00	3.00	3.00	3.00	3.00	3.00
Felt, shiny surfaced	"	6.00	1.00	1.00	6.00	1.00	1.00
Concrete and mortar	Cu. Yds.	2.00	2.00	2.00	2.75	2.80	2.85
Concrete masonry units or tile	M Sq. Ft.	.08	.11	.15	.62	.66	.69
Construction lumber 2" and under	M.B.M.	1.95	1.35	1.35	1.90	1.30	1.30
Finish and siding	M.B.M.	.75	.75	.75	.04	.04	.04
Doors and frames	No.	1.00	1.00	1.00	1.00	1.00	1.00
1/2" fiber board, vaporproof	M Sq. Ft.	-	.51	-	-	.51	-
1" fiber board, vaporproof	M Sq. Ft.	-	-	.51	-	-	.51
Heating stove, wood-burning, 25 lbs.	No.	1.00	1.00	1.00	1.00	1.00	1.00
Rough hardware	Dollars	1.00	1.00	1.00	1.00	1.00	1.00
Bolts	"	.70	.70	.70	.70	.70	.70

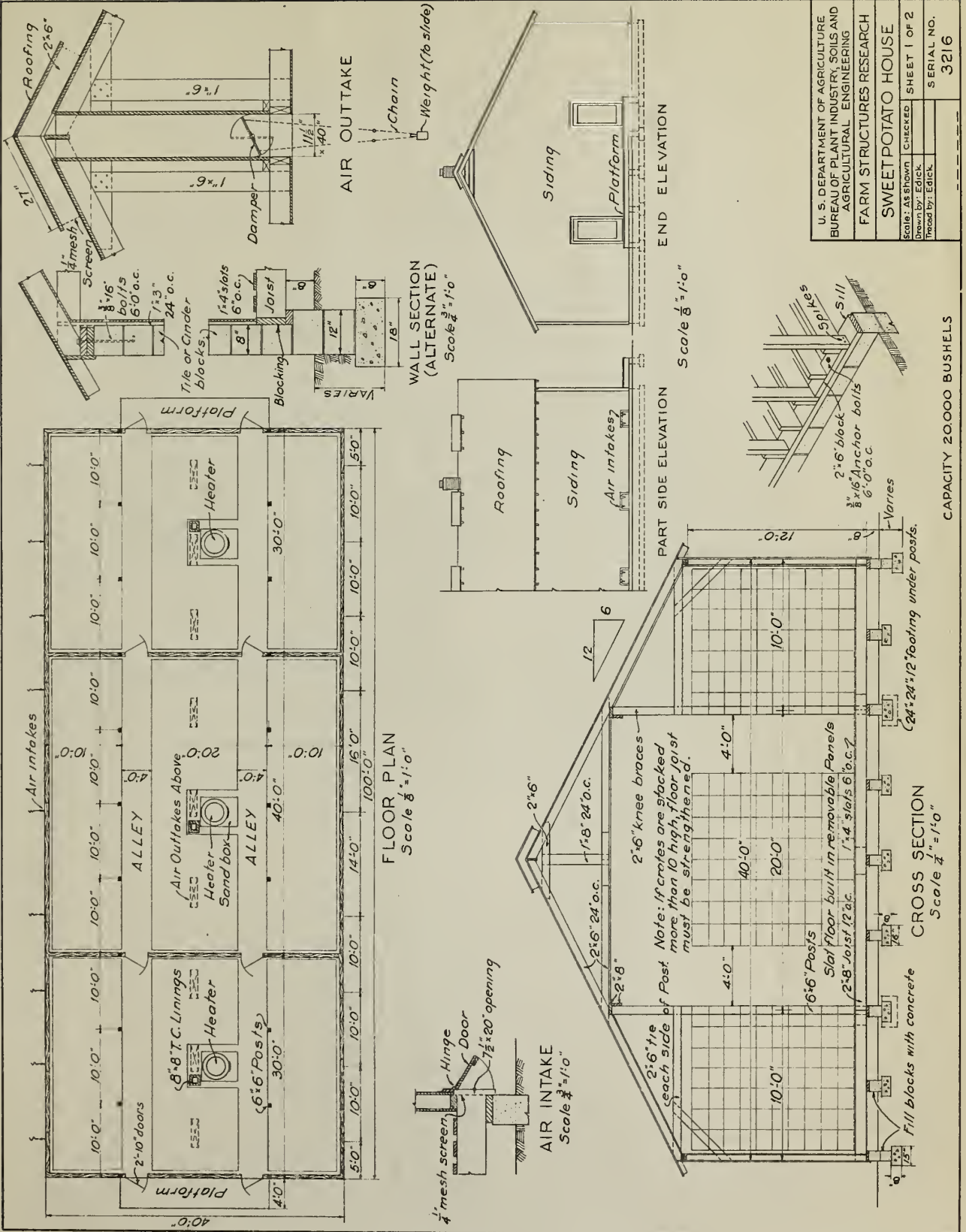




Estimated Material to Build 4000 Bushel Sweetpotato Storage  
Size - 24' x 36' Plan No. 3215

- 10 -

Material	Unit of Measure	Frame Construction			Masonry Walls		
		Zone A	Zone B	Zone C	Zone A	Zone B	Zone C
Sheet steel	Lbs.	20.00	20.00	20.00	20.00	20.00	20.00
Nails	"	300.00	240.00	240.00	140.00	140.00	140.00
Copper wire							
Non-metallic sheathed cable							
2/c. #14	Ft.	50.00	50.00	50.00	50.00	50.00	50.00
2/c. #12 Service	"	10.00	10.00	10.00	10.00	10.00	10.00
Lamp cord 2/c. #16	"	10.00	10.00	10.00	10.00	10.00	10.00
Brick	M	.66	.66	.66	.66	.66	.66
Flue lining	Lin. ft.	22.00	22.00	22.00	22.00	22.00	22.00
Roll roofing	Squares	10.00	10.00	10.00	10.00	10.00	10.00
Building felt	"	25.00	25.00	25.00	25.00	1.00	1.00
Concrete and mortar	Cu. yds.	9.00	9.00	9.00	12.60	12.80	13.00
Concrete masonry units or clay tile	M.Sq. ft.	.24	.32	.40	1.89	1.97	2.05
Construction lumber, 2" and under	M.B.M.	5.00	5.40	5.40	4.80	4.80	4.80
Finish, siding and ceiling	M.B.M.	4.80	2.20	2.20	2.60	.02	.02
Doors and frames	No.	1.00	1.00	1.00	1.00	1.00	1.00
1/2" fiber board, vaporproof	M Sq. ft.	.06	2.20		.06	2.20	
1" fiber board, vaporproof	M Sq. ft.			2.20			2.20
2P Serv. switch & meter pan 30 amp.	No.	1.00	1.00	1.00	1.00	1.00	1.00
RLM reflector & lamp socket	No.	3.00	3.00	3.00	3.00	3.00	3.00
S.P. snap switch	No.	1.00	1.00	1.00	1.00	1.00	1.00
Sundry fittings	Dollars	1.50	1.50	1.50	1.50	1.50	1.50
Heating stove, wood-burning wt. 25 lbs.	No.	1.00	1.00	1.00	1.00	1.00	1.00
Rough hardware	Dollars	3.00	3.00	3.00	3.00	3.00	3.00
Bolts	"	2.50	2.50	2.50	2.50	2.50	2.50



U. S. DEPARTMENT OF AGRICULTURE	
BUREAU OF PLANT INDUSTRY, SOILS AND	
AGRICULTURAL ENGINEERING	
FARM STRUCTURES RESEARCH	
SWEET POTATO HOUSE	
Scale: As Shown	Checked
Drawn by: E. J. C.	Sheet 1 of 2
Approved by: E. J. C.	Serial No.
	3216

CAPACITY 20,000 BUSHELS

Estimated Materials to build 20,000 bushel Sweetpotato Storage  
Size - 40' x 100' Plan No. 3216

Material	Unit of Measure	Frame Construction			Masonry Walls		
		Zone A	Zone B	Zone C	Zone A	Zone B	Zone C
Sheet steel	Lbs.	60.00	60.00	120.00	60.00	60.00	120.00
Nails	"	960.00	960.00	960.00	700.00	700.00	700.00
Copper wire							
Non-metallic sheathed cable							
2/c. #14	Ft.	150.00	150.00	150.00	150.00	150.00	150.00
2/c. #10	Ft.	15.00	15.00	15.00	15.00	15.00	15.00
Lamp cord 2/c. #16	Ft.	100.00	100.00	100.00	100.00	100.00	100.00
Brick	M	2.00	2.00	4.00	2.00	2.00	4.00
Flue tile	L.F.	52.00	52.00	104.00	52.00	52.00	104.00
Roll roofing	Sqs.	49.00	49.00	49.00	49.00	49.00	49.00
Felt	Sqs.	80.00	80.00	80.00	42.00	2.00	2.00
Concrete and mortar	Cu. yds.	39.00	40.00	41.00	51.00	52.00	53.00
Concrete masonry or tile units	M Sq. ft.	.95	1.20	1.45	6.00	6.20	6.40
Construction lumber 2" and under	M.B.M.	25.00	25.00	25.00	23.00	23.00	23.00
Construction lumber over 2"	"	1.20	1.20	1.20	.80	.80	.80
Finish, siding and ceiling	"	18.10	5.60	5.60	9.20	.10	.10
Door and frames	No.	8.00	8.00	8.00	8.00	8.00	8.00
1/2" fiber board, vaporproof	M Sq. ft.		10.20			10.20	
1" fiber board, vaporproof	M Sq. ft.						
2P Serv. switch & meter pan 30 amp.	No.	1.00	1.00	1.00	1.00	1.00	1.00
RJ <sup>M</sup> reflectors & lamp sockets	No.	10.00	10.00	10.00	10.00	10.00	10.00
Receptacles	No.	2.00	2.00	2.00	2.00	2.00	2.00
Porcelain outlet boxes & covers	No.	13.00	13.00	13.00	13.00	13.00	13.00
S.P. Snap switch	No.	1.00	1.00	1.00	1.00	1.00	1.00
Sundry fittings	Dollars	2.00	2.00	2.00	2.00	2.00	2.00
Rough hardware	Dollars	20.00	20.00	20.00	20.00	20.00	20.00
Bolts	Dollars	12.00	12.00	12.00	12.00	12.00	12.00
Heating stoves, wt. 25 lbs., wood-burning	No.	3.00	3.00	6.00	3.00	3.00	6.00